

## CLAIMS

1. A photoelectric converter comprising a plurality of pixels each comprising a sensor element for converting incident light into an electrical  
5 signal, and a thin film transistor connected to the sensor element,

wherein an electrode of the sensor element connected to the thin film transistor is disposed above the thin film transistor, and the thin film  
10 transistor has a top gate type structure in which a semiconductor layer, a gate insulating layer, and a gate electrode layer are laminated successively on a substrate.

2. A photoelectric converter according to claim  
15 1, wherein the thin film transistors are constituted by a plurality of thin film transistors which are connected in series with one another and which use a same gate wiring.

3. A photoelectric converter according to claim  
20 2, wherein the plurality of thin film transistors comprise: a plurality of transferring thin film transistors for transferring electrical signals from the sensor elements, respectively; and a plurality of resetting thin film transistors for resetting the  
25 sensor elements, respectively.

4. A photoelectric converter according to claim  
2, wherein the plurality of thin film transistors

comprise: a plurality of amplifying thin film transistors for receiving as their inputs electrical signals from the sensor elements, respectively; a plurality of transferring thin film transistors for outputting the electrical signals, respectively; and  
5 a plurality of resetting thin film transistors for resetting the sensor elements, respectively.

5. A photoelectric converter according to any one of claims 2 to 4, wherein each of channel regions  
10 of the plurality of thin film transistors is wider than each of gate electrodes of the plurality of thin film transistors.

6. A radiation image pickup device, comprising: the photoelectric converter as claimed in any one of  
15 claims 1 to 5; and a conversion unit provided on a light incidence side of the photoelectric converter for converting radiation into light.

7. A radiation image pickup device comprising a plurality of pixels each comprising a sensor element  
20 for converting radiation into an electrical signal, and a thin film transistor connected to the sensor element,

wherein an electrode of the sensor element connected to the thin film transistor is disposed  
25 above the thin film transistor, and the thin film transistor has a top gate type structure in which a semiconductor layer, a gate insulating layer, and a

gate electrode layer are laminated successively on a substrate.

8. A radiation image pickup device according to claim 7, wherein the thin film transistors are  
5 constituted by a plurality of thin film transistors which are connected in series with one another and which use a same gate wiring.

9. A radiation image pickup device according to claim 7, wherein a storage capacitor is connected to  
10 the sensor element.

10. A radiation image pickup device according to claim 8, wherein the plurality of thin film transistors comprise: a plurality of transferring thin film transistors for transferring electrical  
15 signals from the sensor elements, respectively; and a plurality of resetting thin film transistors for resetting the sensor elements, respectively.

11. A radiation image pickup device according to claim 8, wherein the plurality of thin film  
20 transistors comprise: a plurality of amplifying thin film transistors for receiving as their inputs electrical signals from the sensor elements, respectively; a plurality of transferring thin film transistors for outputting the electrical signals,  
25 respectively; and a plurality of resetting thin film transistors for resetting the sensor elements, respectively.

12. A radiation image pickup device according to any one of claims 8 to 11, wherein each of channel regions of the plurality of thin film transistors is wider than each of gate electrodes of the plurality  
5 of thin film transistors.

13. A radiation image pickup device in which pixels comprising at least: a plurality of semiconductor conversion elements for converting radiation into electric charges; and a plurality of  
10 thin film transistors (TFTs) formed below the plurality of semiconductor conversion elements are disposed in matrix on an insulating substrate,

wherein the thin film transistor has source and drain electrodes, a impurity doped semiconductor  
15 layer, a semiconductor layer, an insulating layer, and a gate electrode formed in this order on the insulating substrate.

14. A radiation image pickup device according to claim 13, wherein the gate electrode of the thin  
20 film transistor is formed so as to overlap the source and drain electrodes.

15. A radiation image pickup device according to claim 13, wherein the gate electrode of the thin film transistor is formed so as not to overlap the  
25 source and drain electrodes.

16. A radiation image pickup device according to claim 13, wherein the source and drain electrodes

of the thin film transistor are covered with the impurity doped semiconductor layer.

17. A radiation image pickup device according to any one of claims 13 to 16, wherein an insulating  
5 layer is formed between the insulating substrate and the thin film transistors.

18. A radiation image pickup device according to claim 17, wherein the insulating layer formed between the insulating substrate and the thin film  
10 transistors is made of any one of SiN, SiO<sub>2</sub>, and SiON.

19. A radiation image pickup device in which pixels comprising: a wavelength conversion unit for wavelength-converting radiation; a plurality of semiconductor conversion elements for converting the  
15 wavelength-converted radiation into electric charges; and a plurality of thin film transistors formed below the semiconductor conversion elements are disposed in matrix on an insulating substrate,

wherein the thin film transistor has source and  
20 drain electrodes, a impurity doped semiconductor layer, a semiconductor layer, an insulating layer, and a gate electrode formed in this order on the insulating substrate.

20. A radiation image pickup system,  
25 comprising:

the radiation image pickup device as claimed in any one of claims 6 to 19;

processing means for generating an image as an object for image pickup on the basis of electrical signals obtained from the radiation image pickup device; and

- 5       display means for displaying the image generated by the processing means.